



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/597,534	06/20/2000	Michael J. Piatt	SPP258KPA	5984

7590

02/07/2005

Barbara Joan Haushalter
228 Bent Pines Court
Bellefontaine, OH 43311

EXAMINER

NGUYEN, MADELEINE ANH VINH

ART UNIT

PAPER NUMBER

2626

DATE MAILED: 02/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding. .

Office Action Summary

Application No.

09/597,534

Applicant(s)

PIATT ET AL.

Examiner

Madeleine AV Nguyen

Art Unit

2626

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10/8/2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) 21-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10/8/2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

This communication is responsive to amendment filed on October 08, 2004.

Applicant replaces Fig.4, cancels claims 8, 12, amends the specification, claims 1, 2, 9, and adds new claims 21-27.

Election/Restrictions

1. Newly submitted claims 21-27 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:
 - a. Claims 1-20 claims a method of defining printer media and inking intensity compatibility in a printing system comprising the steps of selecting one limiting condition for the identified printer and substrate; determining an upper ink limit based on ink and substrate parameters and using the upper ink limit to generate a tone scale to calibrate any ink color on any substrate for the printing system.
 - b. Claims 21-27 claim a method of determining substrate and ink compatibility in a printing system comprising the steps of providing a test pattern having a range of ink loading levels and including test features corresponding to at least one of text and graphics; selecting an ink loading level for at least one of the at least one of text and graphics using the test pattern and generating a tone scale transformation wherein the selected ink loading level is dependent on the identified substrate.
 - c. The inventions in claims 1-20 and claims 21-27 are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct

Art Unit: 2626

from each other if they are shown to be separately usable. In the instant case, invention in claims 21-27 has separate utility such as the steps of providing a test pattern having a range of ink loading levels; selecting an ink loading level and generating a tone scale transformation for one or more ink colors of the identified ink set using the selected ink loading level.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 21-27 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Response to Arguments

2. Applicant's arguments, see pages 10-12, filed on October 08, 2004, with respect to the rejection(s) of claim(s) 1-20 under 35 USC 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Shin (US Patent No. 6,351,320).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2626

4. Claims 1, 3-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shin (US Patent No. 6,351,320).

Concerning claim 1, Shin discloses a method of defining printer media and inking intensity compatibility in a printing system (Figs.1, 2) comprising the steps of identifying a printer and a substrate for use in color printing (col. 2, lines 9-37; col. 4, lines 27-58; col. 5, lines 27-28); printing a color test pattern of a plurality of test patches with the identifier printer and the identified substrate (Fig.2; col. 5, lines 28-53); generating a tone scale curve for each ink; selecting one limiting condition for the identified printing and substrate (col. 6, lines 36-39); determining an upper ink limit (col. 6, lines 64-66); generating a tone scale to calibrate any ink color on any substrate for the printing system (col. 6, lines 36-63; col. 9, lines 3-23).

Shin does not directly teach that the step of generating a tone scale to calibrate any ink color is performed by using the determined upper ink limit. However, Shin teaches that “a selection was made as a function of which of the media maximizes the dynamic range of ink and at the same time does not sacrifice any gamut. If an obvious color shift occurs in different media, however, the color output can be adjusted without changing the three-dimensional color correction look-up table but instead by adjusting the TRC of the color shifted.” (col. 6, line 64 – col. 7, line 8). In addition, Shin further teaches “Once the CMY and K signals have been generated by GCR table 88, the tone or lightness is adjusted by modification with a tone reproduction curve table 90 as is known by those skilled in the art.” (col. 9, lines 12-15). It would have been obvious to one skilled in the art at the time the invention was made to consider the function of which of the media maximizes the dynamic range of ink can determine an upper

Art Unit: 2626

ink limit so that it can generate a tone scale to calibrate the ink color as taught in Shi since the upper ink limit can be calculated by using that function.

Concerning claim 3-7, 9-11, 13, Shin further teaches the step of fitting a curve to the $L^*a^*b^*$ data plot (claim 3), (col. 6, lines 12-63); linearly increasing applied ink level to a specified upper ink limit and deriving a corresponding one dimensional transform (claim 4), (col. 6, line 36 – col.7, line 8) ; generating a transfer function that produces a linear relationship from the substrate color to a maximum ink limit (claim 5), (col. 6, line 36 – col.7, line 8); the plurality of test patches linearly increase in applied inking level over an entire dynamic range of printing system (claim 6), (col. 5, lines 26-53); the step of using a spectrophotometer to scan the color test pattern (col. 5, lines 45-53); determining a first upper ink limit for preferred color text; determining a second upper ink limit for graphics (claim 7), (col. 7, line 63 – col. 8, line 42); the ink limit of each ink color in a printing used for graphics or text is derived from the subjective determination of the total upper ink limit (claims 9-11), (col. 7, line 39 – col. 8, line 62); the color test pattern comprises a test pattern containing image and graphics data that bracket a usable range of ink loading over a range of acceptable substrates for color printing operations to determine a suitable ink limit on a particular substrate (claim 13); (col. 5, line 26 – col. 6, line 63).

Concerning claims 14-20, Shin teaches a method of defining printer media an inking intensity compatibility as discussed in claim 1 above. Shin further teaches the step of employing a portion of the color test pattern for determining the dynamic color range of the deposited ink and re-calibrating a range of tone scale to prevent the excessive ink coverage for the plurality of inks on the identified substrate. Shin further teaches that each test sheet has 1,000 patches of

Art Unit: 2626

colors for each of a plurality of media types, wherein the ink coverage levels span a range of ink coverage for a variety of substrates (claims 15-20), (col. 5, lines 26-53; col. 6, line 12-35).

For claims 14-20, Shin fails to directly teach that the step of employing a portion of the color test pattern is for determining the threshold for excessive ink coverage and the recalibrating step is for recalibrating a range of tone scale to remain below the threshold of excessive ink coverage. However, Shin teaches that a color range analyzer 68 generates a graphical representation of the dynamic color range of the deposited inks for each of the test sheets 54 through 64 due to the fact that the ink characteristics create a real color gamut, the range of the desirable color attribute (col. 45-64). Shin further teaches that determine the impact on the maximum range of color gamut, three different color correction lookup tables were generated using tetrahedral interpolation and normalized tone reproduction curve (TRC) technique (col. 6, lines 36-39), and a selection was made as a function of which of the media maximizes the dynamic range of ink and at the same time does not sacrifice any gamut (col. 6, lines 64-66). Then, the tone reproduction curve is adjusted without changing the color correction lookup table to prevent the excessive ink coverage (col. 6, line 64 – col. 7, line 8). In addition, Fig.3 illustrates dynamic color range in CIE L*a*b* space for a plural number of different media types and Fig.4 illustrates graphically lightness change for the different media types of Fig.3. Thus, from these figures, we can determine the threshold of excessive ink coverage for the identified printer and substrate and the recalibrating of the TRC is for the range of tone scale to remain below the maximum range to prevent excessive ink coverage. It would have been obvious to one skilled in the art at the time the invention was made to consider the process of recalibrating the TRC for controlling the amount of inks on different substrates equivalent to the recalibrating a

Art Unit: 2626

range of tone scale to remain below the threshold of excessive ink coverage as claimed since both of them have the same result of controlling the amount of ink or maximum range of ink in an identified printer and an identified substrate.

5. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shin as applied to claim 1 above, and further in view of Perry et al (US Patent No. 6,483,518).

Concerning claim 2, Shin further teaches the step of measuring the color test pattern $L^*a^*b^*$ color space reference from substrate color (col. 6, lines 12-27).

Shin teaches the step of measuring color intensity but fails to teach the use of Euclidian distance from the substrate color as a measure of color intensity. Perry et al teaches a method for representing a device color gamut as a detail directed hierarchical distance field wherein the distance field representing the device color gamut is enclosed with a bounding box. Fig.5 shows a hierarchical distance field (HDF) header 500 including a distance metric identifier 520. The distance metric specified by the distance metric identifier 520 can be of different kinds including Euclidean distance which is commonly known as a measure of color intensity (Abstract; col. 2, lines 51-67; col. 9, lines 50-61). It would have been obvious to one skilled in the art at the time the invention was made to combine the above teaching of Perry et al regarding the use of Euclidian distance as a measure of color intensity to determine the color intensity in Shi since the Euclidian distance is a commonly know distance metric for determining a measure of color intensity.

Conclusion

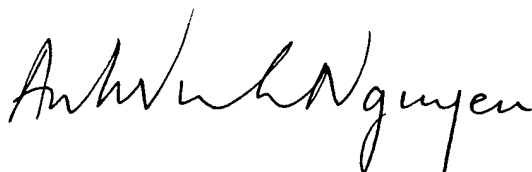
6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. Hirakazu (US 2001/0028471) discloses a method or and apparatus for correcting color of print medium (color of paper sheet) and proofer.
- b. Mahy et al (US Patent No. 6,575,095) teaches a method and apparatus for calibration that takes into account changes of characteristics of the printing system.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Madeleine AV Nguyen whose telephone number is 703 305-4860. The examiner can normally be reached on 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kimberly A Williams can be reached on 703 305-4863. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Madeleine AV Nguyen
Primary Examiner
Art Unit 2626

February 3, 2005